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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,499	09/27/2001	Eiichi Nishimura	31869-174988	8830

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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/963,499	NISHIMURA, EIICHI	
	Examiner	Art Unit	
	Walter F. Briney III	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horna (US Patent 4,600,815) in view of Lane et al. (US Patent 6,381,224).**

Claim 9 is limited to *a method of cancelling an echo of a receive signal in a transmit signal while controlling a signal level of the transmit signal.* Horna discloses an automatic gain control for echo cancellers and similar adaptive systems. See Abstract. The embodiment of interest is depicted in figure 3. Clearly, the echo canceller system disclosed by Horna includes all the typical elements of an echo canceller that removes an echo of a received signal from a send signal (i.e. *step (d)*). In addition to the typical components, Horna discloses two matched attenuators (32 and 33) that equally amplify the send signal and the echo replica signal before combining them at the summer (12) (i.e. *steps (e) through (g)*). These attenuators share a common control (302), however, Horna does not disclose or suggest how or when to update the amount of attenuation provided by the attenuators, but that the attenuators only attenuate signals of abnormally high amplitude, which is consistent with a typical automatic gain control system. Therefore, Horna anticipates all limitations of the claim with the exception of *detecting activity of the transmit signal and the receive signal, generating signal level*

data for the transmit signal, and updating the signal level data when the transmit signal is active and the receive signal is inactive.

Lane teaches a method and apparatus for controlling a full-duplex communications system. See Abstract. The features of Lane depicted in figure 3 represent an acoustic echo canceller with AGC applied to the microphone input, which is similar to the system disclosed by Horna. The main difference between Horna and Lane is that Lane teaches detecting the speech state of both the near and far end signals before applying a type of gain control (i.e. *step (a)*). See column 3, lines 53-57. It is clear that this enables the system to maintain the input signal's dynamic range in various circumstances that require different optimal approaches. For example, during a talk mode (i.e. *transmit signal is active and receive signal is inactive*), a gain factor (G) is updated according to typical AGC methods (i.e. *steps (b) and (c)*). See column 5, lines 21-31. It would have been obvious to replace the AGC method of Horna with the speech state dependent AGC method as taught by Lane for the purpose of controlling the dynamic range based on the various optimal operating methods required by the different speech states.

Claim 10 is limited to *the method of claim* 9, as covered by Horna in view of Lane. The echo canceller filter (14) is disclosed as being sensitive to double-talk situations, and disables its adaptation in the presence thereof, while allowing adaptation in the presence of far-end speech only (column 2, lines 33-63) (i.e. *updating the coefficients when the transmit signal is inactive and the receive signal is active*). Therefore, Horna in view of Lane makes obvious all limitations of the claim.

Claim 11 is limited to *the method of claim 9*, as covered by Horna in view of Lane. As seen in figure 4 of Lane, the criteria for detecting talk and listen modes includes a comparison with the threshold T_T, (i.e. *a first minimum input level*) and the threshold T_R, (i.e. *a second minimum input level*). Therefore, Horna in view of Lane makes obvious all limitations of the claim.

Claim 12 is limited to *the method of claim 9*, as covered by Horna in view of Lane. As disclosed by Horna, the two attenuators (32 and 33) must have identical gain to stabilize the echo loop (i.e. *wherein said step (f) and said step (g) employ identical gain factors*). See column 4, lines 27-40. Therefore, Horna in view of Lane makes obvious all limitations of the claim.

2. **Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horna (US Patent 4,600,815) in view of Lane et al. (US Patent 6,381,224) and further in view of Li et al. (US Patent 6,580,795).**

Claim 13 is limited to *an echo canceller receiving a transmit signal and a receive signal, the transmit signal including an echo of the receive signal.* In the rejection of claim 11, it was shown that Horna in view of Lane makes obvious detecting activity for AGC devices by comparing the transmit and receive signals to first and second minimum input levels. Also see the proceeding section entitled Response to Arguments for treatment of the applicant's instant arguments concerning this limitation. To accomplish the above, the attenuators (32) and (33) disclosed by Horna were replaced with the talk-mode sensitive AGC devices as taught by Lane, which update their gain in response to the *signal level data* G. Also, it was shown in the rejection of claim 10 that

Horna discloses controlling echo canceller filter coefficient updating based on the presence of double-talk. However, claim 10 made no mention of determining activity for the echo canceller using *first* and *second minimum input levels*, and neither Horna nor Lane make disclose, teach or suggest doing so. Therefore, Horna in view of Lane have been shown to make obvious all limitations of the claim with the exception of *updating filter coefficients when the transmit signal is less than a first minimum input level and the receive signal exceeds a second minimum input level.*

Li teaches an echo canceller for a full-duplex communication system and method therefor. See Abstract. The goal of Li is to provide accurate double-talk detection for controlling adaptive filter coefficient updating. See figure 8. To this end, Li employs the same scheme outlined by Lane. See figure 4 of both references. And in addition, Li teaches an explicit method for determining the talk state, seen in figure 7, which neither Horna nor Lane disclose or teach.

It would have been obvious to one of ordinary skill in the art to employ the method of talk-state detection for the echo canceller as taught by Li (figure 7) simply because neither Horna nor Lane explicitly teach or fairly suggest an accurate method.

Clearly, the similarities of Lane and Li suggest that the teachings of Lane involving adaptive talk-state thresholds would enhance the accuracy of the talk detector of Li. Such that, the first and second minimum input levels used for both control of the echo canceller and the attenuators of Horna are the same.

It would have been obvious to one of ordinary skill in the art to use the same thresholds for talk-state detection as taught by Lane in both the echo canceller and

attenuators since the thresholds generated by Lane are adapted for optimal settings in diverse environments. See column 6, lines 8-25, of Lane.

Claim 14 is limited to *an echo canceller receiving a transmit signal and a receive signal, the transmit signal including an echo of the receive signal.* As shown in the rejection of claim 13, Horna in view of Lane and further in view of Li makes obvious an echo cancellation signal generator, a signal level data generator and first and second automatic gain control units that update their respective coefficients, signal level data, and gains based on the transmit and receive signals relation to first and second minimum input levels. Furthermore, as shown in the rejection of claim 9, Horna includes an *arithmetic unit* (12) that *subtracts* the *amplified echo cancellation signal* from the *amplified transmit signal.* Therefore, Horna in view of Lane and further in view of Li makes obvious all limitations of the claim.

Claim 15 is limited to *the echo canceller of claim 14*, as covered by Horna in view of Lane and further in view of Li. As disclosed by Horna, the gains of attenuators (32) and (33) are equal. See column 4, lines 27-36. Therefore, Horna in view of Lane and further in view of Li makes obvious all limitations of the claim.

Response to Arguments

Applicant's arguments filed 21 January 2005 have been fully considered but they are not persuasive.

With respect to claim 9, the applicant wrongly concludes on page 7 of the current response that the examiner indicated that Horna fails to disclose updating echo

cancellation coefficients only during conditions (a) and (d) of figure 4. It is respectfully submitted that the applicant was referring to updating a signal level in accordance with clause (c) of claim 9.

With further respect to claim 9, the applicant alleges on page 8, first point, of the current response that Lane teaches directly away from claim 9 because Lane adapts the gain during double-talk; the examiner respectfully disagrees. Lane only *adapts* the gain during double-talk in the sense that the measured value G (i.e. *signal level data*), which is determined during the TALK state, is predictably scaled by a constant value in accordance with equation 2 to derive a gain value. While this gain value is different than the gain used in the TALK state, it is important to realize that the value G remains unchanged. As G has been mapped to the signal level data, it is clear that Lane does teach clause (c) of claim 9. With respect to clauses (e) and (f), simply *amplifying...according to the signal level data* suggests a certain amount of separation between the level of amplification and the signal level data, thus the level of amplification applied may be scaled the manner taught by Lane.

With further respect to claim 9, the applicant alleges on page 8, second point, of the current response that the fact that Lane applies a transmitting gain and a receiving gain of value G^{-1} somehow differentiates from claim 9; the examiner respectfully disagrees. The receiving AGC (63) taught by Lane is simply not relied upon in the rejection of claim 9. In review, the AGC devices (32) and (33) of Horna have been replaced with the three-mode AGC devices of Lane. By placing an AGC device at

the output of the adaptive filter (14), Horna obviates the need for a receive AGC as taught by Lane and the application of gain G^{-1}.

With further respect to claim 9, the applicant alleges on pages 8 and 9, third point, of the current response that G is adapted in all modes except the LISTEN mode; the examiner respectfully disagrees for the reasons presented above in connection with the applicant's first point. For all the reasons above, the rejection of claim 9 is maintained.

With respect to claims 10-12, the applicant alleges that these claims are allowable for at least the reasons relating to claim 9. As these reasons have been shown to be unpersuasive, the rejections of these claims are maintained.

With respect to claims 13 and 14, the applicant alleges on page 9, fourth point, of the current response that the two modes of Lane are distinguished from the instant claims by the energy-ratio scheme illustrated in figure 5 thereof, which is unlike the minimum-level scheme of new claims 13 and 14; the examiner respectfully disagrees. First, figure 5 of Lane depicts transmit to receive energy probability ratios that are used in determining values X_T, X_R, $T_{T'}$ and $T_{R'}$, but is not used on its own to determine the talk state. To the contrary, values $T_{T'}$ and $T_{R'}$ are used as talk/listen thresholds as identified in figure 4 of Lane. It is submitted that the slope $T_{T'}$ in conjunction with the signal E_R defines a first minimum input level and the slope $T_{R'}$ in conjunction with the signal E_T defines a second minimum input level.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB
6/8/05

SINH TRAN
SUPERVISORY PATENT EXAMINER